Z of an entering card such as card **217** with card entry path Z being respectively at an angle of 75 degrees to a vertical plane Y passing through the outer wall of frame **202** of card cleaning device **200** as generally shown in FIG. **23***b*. Other angles of entry may be utilized depending on the particular printer configuration as long as such angles of entry do not deviate from the intended purpose of the present invention.

The construction and function of card feeder **290** is essentially identical to card feeder **190** of FIGS. **16–18**. A card exit opening **298** is defined between a flexible silicon rubber guide **296** attached to the front of card feeder **290** and the bottom portion **297** of card feeder **290** which allows the passage of only one card at a time as illustrated in FIG. **23***b*. The function of flexible guide **296** and the means of attachment to feeder **290** is identical to flexible guide **196** of FIGS. **16–18**.

Bending of card **217** is achieved naturally by means of flexible guide **296**, which pushes on card **217** preventing the card from lifting up on its own, the translation provided by a second drive roller **294** and a pair of integral symmetrically spaced plastic card entry guides **266, 268** (FIGS. **20, 24***a*) provided on lower portion **201** of frame **202** within each card feeding opening under bottom roller **206** which serve as the zone of first contact for the entering end of card **217** and help prevent premature wear of bottom roller **206**. The line of first contact for the entering end of card **217** is, as shown in FIG. **23***a*, preferably defined by the intersection of the X, Y planes. Thus, the combination of translation and torsion of 15 degrees allows card **217** to pass between bottom cleaning roller **206** and first drive roller **218** for pre-printing cleaning.

A person skilled in the art would recognize that other materials and/or configurations may be used to produce card cleaning device **200**, provided such other materials and/or configurations do not depart from the intended purpose of the present invention. Furthermore, the above-described card cleaning device of FIGS. **20–26** provides a compact, low cost, easy roller access solution to the above-identified problems of the prior art and may be incorporated in a variety of card printers.

While the present invention has been described in detail with regards to the preferred embodiments, it should be appreciated that various modifications and variations may be made in the present invention without departing from the scope or spirit of the invention. For example, the novel card cleaning device of the present invention may be installed in a card printer in other ways as long as there is no departure from the intended purpose of the present invention. Also, projection **260** of FIG. **21** may be eliminated with lid **208** modified similar to lid **108** of FIGS. **8–19**. In this regard, it is important to note that practicing the invention is not limited to the applications described hereinabove. Many other applications and/or alterations may be utilized provided that they do not depart from the intended purpose of the present invention.

It should be appreciated by a person skilled in the art that features illustrated or described as part of one embodiment can be used in another embodiment to provide yet another embodiment such that the features are not limited to the specific embodiments described above. Thus, it is intended that the present invention cover such modifications, embodiments and variations as long as they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A card cleaning device for use in an image forming machine, comprising:

(a) a housing adapted to be removably coupled to said image forming machine;

(b) a first cleaning member removably coupled to said housing and adapted to clean a card being fed at an angle relative to said housing, said housing being adapted to receive said card at an angle; and

(c) a second cleaning member removably coupled to said housing and adapted to clean said first cleaning member during machine operation.

2. The card cleaning device of claim **1**, wherein said second cleaning member is in frictional contact with said first cleaning member and adapted to clean said first cleaning member during machine operation.

3. The card cleaning device of claim **1**, wherein said first cleaning member includes a first roller having a shaft removably coupled to said housing and said second cleaning member includes a second roller having a core removably coupled to said housing, said second roller being in frictional contact with said first roller and adapted to clean said first roller during machine operation.

4. The card cleaning device of claim **3**, further comprising a lid rotatably coupled to said housing substantially over said second roller for rotating between an open position for roller maintenance and a closed position during machine operation, said lid adapted to contact said core of said second roller when said lid is in said closed position.

5. The card cleaning device of claim **4**, further comprising at least one spring operatively coupled between said lid and said housing for spring loading said lid, said spring-loaded lid exerting pressure on said core of said second roller when said lid is in said closed position, said pressure being transferred to said first roller as a result of said frictional contact between said first and second rollers.

6. The card cleaning device of claim **5**, further comprising a first drive roller disposed substantially under said first roller and in frictional contact with a card being fed for passing said card under said first roller for card cleaning.

7. The card cleaning device of claim **3**, further comprising means for guiding the entry of a card being fed at an angle relative to said housing.

8. The card cleaning device of claim **7**, wherein said entry guiding means includes at least one card entry guide coupled to said housing substantially under said first roller for establishing a zone of first contact for said card and for preventing premature wear of said first roller during card feeding.

9. A card cleaning system for use with an image forming machine, comprising:

(a) a housing adapted to be removably coupled to said image forming machine;

(b) a first cleaning member removably coupled to said housing and adapted to clean a card being fed at an angle relative to said housing along a card entry path, said housing being adapted to receive said card at an angle, said angle substantially defined between said card entry path and a card exit path relative to said housing;

(c) means for feeding said card at an angle relative to said housing; and

(d) a second cleaning member removably coupled to said housing and adapted to clean said first cleaning member during machine operation.

10. The card cleaning system of claim **9**, wherein said second cleaning member is in frictional contact with said first cleaning member and adapted to clean said first cleaning member during machine operation.

11. The card cleaning system of claim **9**, wherein said first cleaning member includes a first roller having a shaft

removably coupled to said housing and said second cleaning member includes a second roller having a core removably coupled to said housing, said second roller being in frictional contact with said first roller and adapted to clean said first roller during machine operation.

12. The card cleaning device of claim 11, further comprising a lid rotatably coupled to said housing substantially over said second roller for rotating between an open position for roller maintenance and a closed position during machine operation, said lid adapted to contact said core of said second roller when said lid is in said closed position.

13. The card cleaning device of claim 12, further comprising at least one spring operatively coupled between said lid and said housing for spring loading said lid, said spring-loaded lid exerting pressure on said core of said second roller when said lid is in said closed position, said pressure being transferred to said first roller as a result of said frictional contact between said first and second rollers.

14. The card cleaning device of claim 13, further comprising a first drive roller disposed substantially under said first roller and in frictional contact with a card being fed for passing said card under said first roller for card cleaning.

15. The card cleaning device of claim 11, wherein said card feeding means includes a card feeder disposed proximate to said housing substantially over said card entry path, a second drive roller disposed substantially under said card feeder for translating said card along said card entry path and at least one card entry guide coupled to said housing substantially under said first roller for establishing a zone of first contact for an entering card and for preventing premature wear of said first roller during card feeding, said card feeder mechanism adapted to bend said card upon card contact with said at least one card entry guide to enable card feeding at an angle relative to said housing.

* * * * *

16. (new) For use in a printer or other system forming images on cards or other such media, a replaceable media cleaning cartridge comprising:

a. a first cleaning component structured and arranged to engage and present to a moving media unit being cleaned, a changing first contact surface area; and

b. a second cleaning component structured and arranged to engage and present to said first cleaning component, a changing second contact surface area;

c. the tackiness of said second contact surface area being greater than the tackiness of said first contact surface areas which in turn is greater than the tackiness of a media unit such that said first surface area adhesively attracts particles from a media unit being cleaned, and said second surface area adhesively attracts particles from said first surface area.

17. (new) The media cleaning cartridge of claim 16 wherein said first component comprises a roller.

18. (new) The media cleaning cartridge of claim 16 wherein said second component comprises a roller.

19. (new) The media cleaning cartridge of claim 16 wherein said second component is structured for quick removal from said cartridge.

20. (new) The media cleaning cartridge of claim 16 wherein said first component is structured for quick removal from said cartridge.

21. (new) The media cleaning cartridge of claim 16 wherein both of said first and second components are structured for quick removal from said cartridge.

22. (new) The media cleaning cartridge of claim 16 wherein said second contact surface is

replaceable.

23. (new) The media cleaning cartridge of claim 16 wherein said cartridge has a frame which supports said first and second components, said frame being configured such that at least said first component is supported in a slot in said frame.

24. (new) The media cleaning cartridge of claim 16 wherein said cartridge has a frame which supports said first and second components, said frame being configured such that at least said second component is supported in a slot in said frame.

25. (new) The media cleaning cartridge of claim 16 wherein said cartridge has a frame which supports said first and second components, said frame being configured such that said first and second components are supported in one or more slots in said frame.

26. (new) The media cleaning cartridge of claim 16 wherein said cartridge includes a resilient member adapted to bias said second component into engagement with said first component.

27. (new) The media cleaning cartridge of claim 16 adapted to mount said first component above said second component such that gravity forces said first component against said media unit.

28. (new) The media cleaning cartridge of claim 16 wherein the total second contact surface area on said second component is greater than the total first contact surface area on said first component.

29. (new) The media cleaning cartridge of claim 16 wherein said second component comprises a disposable tube having said second surface area and a core upon which said tube is mounted.

30. (new) The media cleaning cartridge of claim 29 wherein said core compises a pair of end caps, one positioned in each end of said tube.

31. (new) For use in a printer or other system forming images on cards or other such media, a replaceable media cleaning cartridge adapted to be received in the system and configured to support one or more cleaning components structured and arranged to engage and present to a moving media unit being cleaned a changing tacky contact surface area.

32. (new) The media cleaning cartridge of claim 31 which is bidirectionally effective and adapted to receive a media unit on either of opposed first and second faces thereof.

33. (new) The media cleaning cartridge of claim 31 including mounting structures adapted for quick installation of the cartridge in the system.

34. (new) The media cleaning cartridge of claim 33 wherein said mounting structures include a latch.

35. (new) The media cleaning cartridge of claim 31 including at least one upstanding tab adapted to be manually grasped for installation of the cartridge into the system.

36. (new) The media cleaning cartridge of claim 35 wherein said cartridge includes an upstanding arm on each side of the cartridge.

37. (new) The media cleaning cartridge of claim 36 wherein said arms are resilient and adapted to be flexed toward each other to facilitate installation of the cartridge in the system.

38. (new) The media cleaning cartridge of claim 37 wherein said arms each have a detent provision configured to cooperate with detent provisions in the system to locate the cartridge in

an operative position in the system.

39. (new) The media cleaning cartridge of claim 31 including alignment members on opposed sides of the cartridge configured to be received in cooperating alignment guides in the system.

40. (new) The media cleaning cartridge of claim 39 wherein said alignment members are structured to be received in slots in the system.

41. (new) The media cleaning cartridge of claim 31 wherein said cartridge has a pivoted lid.

42. (new) The media cleaning cartridge of claim 41 including a resilient member mounted to bias said lid to a closed position.

43. (new) The media cleaning cartridge of claim 42 wherein said second component comprises a roller having an axle, and wherein said lid engages said axle to transfer said bias to said second component.

44. (new) The media cleaning cartridge of claim 31 wherein said cartridge has a frame which supports said one or more cleaning components and is configured to define a media access opening on a first face of said cartridge.

45. (new) The media cleaning cartridge of claim 44 wherein said opening comprises a window with at least one beveled edge.

46. (new) The media cleaning cartridge of claim 44 wherein said cartridge is adapted to receive a media unit to be cleaned through said opening along an input path having a predetermined acute entry angle relative to horizontal.

47. (new) The media cleaning cartridge of claim 46 wherein said acute entry angle is about 15 degrees.

48. (new) The media cleaning cartridge of claim 47 wherein said exit angle is substantially horizontal.

49. (new) The media cleaning cartridge of claim 46 wherein said cartridge is adapted to eject a media unit which has been cleaned through said opening along an output path having a predetermined exit angle which is different than said entry angle relative to horizontal.

50. (new) A printer or other system forming images on cards or other such media, comprising:

a. a chassis;

b. a media feed supported by said chassis; and

c. a replaceable media cleaning cartridge supported by said chassis adjacent the media feed, said cartridge comprising:

i. a first cleaning component structured and arranged to engage and present to a moving media unit being cleaned, a changing first contact surface area; and

ii. a second cleaning component structured and arranged to engage and present to said first cleaning component, a changing second contact surface area;

iii. the tackiness of said second contact surface area being greater than the tackiness of said first contact surface areas which in turn is greater than the tackiness of a media unit such that said first surface area adhesively attracts particles from a media unit being cleaned and said second surface area adhesively attracts particles from said first surface area.

51. (new) The system of claim 50 wherein said first component comprises a roller.

52. (new) The system of claim 50 wherein said second component comprises a roller.

53. (new) The system of claim 50 wherein said second component is adapted for quick removal from said cartridge.

54. (new) The system of claim 50 wherein said second surface is replaceable.

55. (new) The system of claim 50 wherein said cartridge has a frame which supports said first and second components, said frame being configured such that at least said second component is supported in slots in said frame.

56. (new) The system of claim 50 wherein said cartridge includes a resilient member for biasing said second component into engagement with said first component.

57. (new) The system of claim 50 adapted to mount said first component above said second component such that gravity forces said first component against said media unit.

58. (new) The system of claim 50 including mounting structures configured for quick installation in the system.

59. (new) The system of claim 58 wherein said mounting structures include a latch.

60. (new) The system of claim 50 wherein the total second contact surface area on said second component is greater than the total first contact surface area on said first component.

61. (new) The system of claim 50 wherein said second component comprises a disposable tube having said second surface area and a core upon which said tube is mounted.

62. (new) A printer or other system forming images on cards or other such media, comprising:

a. a chassis;

b. a media feed supported by said chassis; and

c. a replaceable media cleaning cartridge supported by said chassis and adapted to be received in the system, the cartridge being configured to support one or more cleaning components structured to engage and present to a moving media unit being cleaned a changing tacky contact surface area.

63. (new) The system of claim 62 wherein said cartridge is bidirectionally effective to receive a media unit on either of opposed first and second faces thereof.

64. (new) The system of claim 62 wherein said cartridge and said chassis have mounting structures adapted for quick installation of the cartridge in the system.

65. (new) The system of claim 64 wherein said mounting structures include a latch.

66. (new) The system of claim 62 wherein said cartridge includes at least one upstanding tab adapted to be manually grasped for installation of the cartridge into the system.

67. (new) The system of claim 66 wherein said cartridge includes an upstanding arm on each side of the cartridge.

68. (new) The system of claim 67 wherein said arm is resilient and adapted to be flexed to facilitate installation of the cartridge in the system.

69. (new) The system of claim 68 wherein said arms have detent provisions configured to cooperate with detent provisions in the chassis to position the cartridge in the system.

70. (new) The system of claim 62 including alignment members on opposed sides of the cartridge configured to be received in cooperating alignment guides in the chassis.

71. (new) The system of claim 70 wherein said alignment guides comprise slots.

72. (new) The system of claim 62 wherein said cartridge has a pivoted lid.

73. (new) The system of claim 72 wherein said cartridge includes a spring mounted to bias said lid to a closed position.

74. (new) The system of claim 73 wherein second component comprises a roller having an axle, and wherein said lid engages said axle to bias said second component against said first component.

75. (new) The system of claim 62 wherein said cartridge has a frame configured to define a media access opening on a first face of said cartridge.

76. (new) The system of claim 75 wherein said opening comprises a window with at least one beveled edge.

77. (new) The system of claim 75 wherein said cartridge is adapted to receive a media unit to be cleaned through said opening along an input path having a predetermined acute entry angle relative to horizontal.

78. (new) The system of claim 77 wherein said acute entry angle is about 15 degrees.

79. (new) The system of claim 78 wherein said exit angle is substantially horizontal.

80. (new) The system of claim 77 wherein said cartridge is adapted to eject a media unit which has been cleaned through said opening along an output path having a predetermined exit angle which is different than said entry angle relative to horizontal.

81. (new) A media cleaning method, comprising:

a. providing a printer or other media image-forming system;

b. providing a cleaning cartridge for said system, comprising:

i. a first cleaning component structured and arranged to engage and present to a moving media unit being cleaned a changing first contact surface area; and

ii. a second cleaning component structured and arranged to engage and present to said first cleaning component a changing second contact surface area;

iii. the tackiness of said second contact surface area being greater than the tackiness of said first contact surface areas which in turn is greater than the tackiness of a media unit such that said first surface area adhesively attracts particles from a media unit being cleaned and said second surface area adhesively attracts particles from said first surface area;

iv. installing the cartridge in the system;

c. moving media through said system until the effectiveness of said second cleaning component in cleaning media has diminished;

d. withdrawing said cartridge from said system; and

e. replacing said second cleaning component.

82. (new) A printer or other system forming images on cards or other such media adapted for use with a replaceable media cleaning cartridge, the system comprising:

a. a media feed; and

b. a system chassis mounting the media feed and configured to receive and support a cartridge adjacent the feed such that a media unit being cleaned is transported by the feed in contact with the cartridge,

c. the system chassis having spaced guides structured to guide and at least assist in retaining the cartridge on the system chassis.

83. (new) The system of claim 82 wherein said guides comprise slots.

84. (new) The system of claim 82 wherein said guides are located on opposed walls of the system chassis.

85. (new) The system of claim 84 wherein said guides comprise channels adapted to engage opposed sides of a cartridge and guide it into an operative position within the system.

86. (new) The system of claim 85 wherein said channels are formed by projections from said opposed walls in said system chassis.

87. (new) The system of claim 82 wherein said system chassis has at least one detent provision adapted to cause said cartridge to snap into said system chassis when the cartridge is located in its operative position.

88. (new) A printer or other system forming images on cards or other such media having a snap-in media cleaning cartridge, comprising:

a. a media cleaning cartridge configured to support one or more cleaning components and structured to engage and present to a moving media unit being cleaned a changing tacky contact surface area;

b. a media feed; and

c. a system chassis mounting the media feed and configured to receive and support the cartridge in an operative position adjacent the feed;

d. the system chassis and the cartridge having cooperative cartridge retention provisions structured to cause said cartridge to snap into said operative position.

89. (new) The system of claim 88 wherein said cartridge has flexible arms on opposed sides which cooperate with channels or slots on opposed walls of said system chassis during installation of said cartridge in said system chassis.

90. (new) The system of claim 89 wherein said cartridge arms and said chassis channels or slots include a detent arrangement.

91. (new) The system of claim 88 wherein said cartridge retention provisions include a detent.

92. (new) The system of claim 88 wherein said cartridge retention provisions include one or more resilient members constituting part of the cartridge, and wherein said one or more resilient members are manually stressed during installation of the cartridge to contribute to the snap-in effect.

93. (new) For use with a media cleaning cartridge for a printer or other system forming images on cards or other such media, the media cleaning cartridge having a first cleaning component structured to engage and present to a moving media unit being cleaned a changing first contact surface area, a second cleaning component comprising:

a. a changing second contact surface area configured and arranged to engage said first contact surface area of said first cleaning component,

b. the tackiness of said second contact surface area being greater than the tackiness of said first contact surface areas which in turn is greater than the tackiness of a media unit being cleaned such that said first surface area adhesively attracts particles from said media unit and said second surface area adhesively attracts particles from said first surface area,

c. said second cleaning component being structured to be readily removed from said cartridge and discarded when the tackiness of said second contact surface area is no longer capable of efficiently adhesively attracting particles from said first contact surface area on said first cleaning component.

94. (new) he second cleaning component of claim 93 comprising a tube having removable end caps.

95. (new) The second cleaning component of claim 94 wherein said end caps have journals adapted to be received in open-ended slots in a cartridge frame.

96. (new) he second cleaning component of claim 93 configured as a roller.

97. (new) A printer or other system forming images on cards or other such media, comprising:

a. a chassis;

b. a media feed supported by said chassis; and

c. a media cleaner supported by said chassis and positioned adjacent the media feed, said media cleaner comprising:

i. a first cleaning component structured and arranged to engage and present to a moving media unit being cleaned a changing first contact surface area; and

ii. a second cleaning component supported above said first component and resting under the force of gravity on said first component, said second component being structured and arranged to engage and present to said first cleaning component a changing second contact surface area;

iii. the tackiness of said second contact surface area being greater than the tackiness of said first contact surface areas which in turn is greater than the tackiness of a media unit such that said first surface area adhesively attracts particles from a media unit being cleaned and said second surface area adhesively attracts particles from said first surface area.

98. (new) The system of claim 97 wherein said first component comprises a roller.

99. (new) The system of claim 97 wherein said second component comprises a roller.

100. (new) The system of claim 97 wherein said second component is structured for quick removal from the system.

101. (new) The system of claim 97 wherein said second component is adapted to be disposable.

102. (new) The system of claim 97 wherein said cleaner has a frame which supports said first and second components, said frame being configured such that at least said second component is held in slots in said frame.

103. (new) The system of claim 97 including a resilient member configured to bias said second component against said first component.

104. (new) The media cleaner of claim 97 wherein the total second contact surface area on said second component is greater than the total first contact surface area on said first component.

105. (new) The system of claim 97 wherein said second component comprises a disposable tube having externally said second surface area and a core upon which said tube is mounted.

106. (new) The system of claim 105 wherein said core comprising a pair of end caps which fit into the ends of the tube.